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NEWS LETTER TO THE FIELD MEN.

February 1, 1915.

For the information of our field men, the Office plans to issue a news letter to them, once a month. It is hoped in this way the men will keep in closer touch with the work of the Office in all its phases. In letters subsequent to this, new projects will be mentioned, as well as progress or completion of those previously noted. The mention in this news letter of work under the different projects must necessarily be brief, and it is hoped that, where an engineer desires fuller information concerning any one activity, he will communicate with the engineer in charge of that particular work.

The titles of the men have been abbreviated for convenience, but are given below in full:

C.E.S.	Civil Engineer Student.
J.H.E.	Junior Highway Engineer.
H.E.	Highway Engineer.
S.H.E.	Senior Highway Engineer.
S.R.C.	Superintendent of Road Construction.
B.E.	Bridge Engineer.
H.B.E.	Highway Bridge Engineer.
A.R.E.	Assistant in Road Economics.

DIVISIONS:

DIVISION OF CONSTRUCTION,
V.M.Pearce, Chief.

Projects:

Field Experiments.

Bids for construction of an experimental road, Arlington to Alexandria, Va., are to be opened January 22. The length of the road is 4.5 miles. Four experiments are to be made with each of the following named rocks: trap, sandstone, granite, and gneiss, by using with each a native asphalt, and an oil asphalt, as binders, both by the penetration and mixing methods. Experiments are also to be made with a gravel aggregate using a native asphalt, an oil asphalt, and a refined coal tar as binders, by the mixing method. This will make 19 experimental sections. L. L. Hewes, S.H.E., is in charge.

Preparations of Specifications.

Standard instructions for preparing plans, and typical specifications for construction, of various types of roads are being prepared as standards for use of field men. It is hoped these will be ready by February 15.

Instruction of Students.

A class of seven are in the Washington Office at present, taking the civil engineer student course:

A.C.Dunn, L.S.Hall, A.L.Hooper, F.R.Lyons,
(all civil engineer students); W.R.Overton,
S.L.Taylor, J.T.Pauls, (all junior highway
engineers).

Object-Lesson Roads.

Elkton, Ky., earth and reconstructed macadam.

W.F.Brooks, S.H.E.

Burlington, N.C., sand-clay. Mack Galbreath, J.H.E.

Brunswick, Ga., probably a shell road. E.O.Hathaway,
S.H.E.

Talihina, Okla., earth road. J.C.Wonders, S.H.E.

County Model Systems.

Final work on county model system in Calcasieu Parish, La., involving \$900,000 expenditure. C.H.Sweetser, S.H.E., Lake Charles, La. Gravel, brick, shell, and earth road construction. Four counties request similar work.

Advice and Inspection.

Boerne, Texas. R.E.Toms, S.H.E. Preparatory for expenditure of \$25,000 bond issue on roads.

Improvement of Post Roads.

Iowa, Dubuque County. Macadam road. U.S. allotment, \$30,000. After the plans are approved it is probable B.H.Burrell, S.H.E., now in the Office, will proceed to Dubuque to advertise for bids.

Kentucky, Bath and Montgomery Counties. Macadam work. U.S. allotment \$13,100. Work stopped by weather conditions. R.E.Toms in charge. Work now 75% complete. All force account.

Maine, Cumberland County. Bituminous macadam, penetration, 21 miles. U.S. allotment \$65,000. Work stopped by weather conditions. Contract work, 10.5 miles surfaced. E.O.Hathaway, S.H.E., in charge (at present in Brunswick, Ga.) assisted by S.L.Taylor (now in Washington Office).

Maryland, Montgomery County. Macadam, 5.4 miles. U.S. allotment \$14,700. All contract. Work practically completed. L.I.Hewes, S.H.E., in charge, assisted by H.K.Craig, H.E. Dr. Hewes now on lecture itinerary. Mr. Craig in Washington, completing report on the road.

Mississippi, Le Flore County. Gravel, 24 miles. U. S. allotment \$50,000. Work delayed for several reasons. H.H.Lotter, S.H.E., Greenwood, Miss., in charge. Assisted by P.A.Rideout, J.H.E.

North Carolina, McDowell County. Grading 12 miles mountain road. U. S. allotment \$10,000. Contract work. W.H.Rhodes, H.E., Old Fort, N. C., in charge, assisted by R.H.Harrison, J.H.E.

North Carolina; Davie, Iredell and Forsyth Counties. J.H.Dodge, S.R.C. (now on furlough, Oberlin, Ohio), in charge of Forsyth and Davie Counties. Assisted by F.A.Davis, J.H.E., Winston-Salem, N. C. H. L. Arbenz, S.H.E., in charge of Iredell County, Statesville, N. C. Assisted by H.S.Parry, J.H.E. Grading and surfacing with top soil, 48 miles. U. S. allotment \$20,575. 75% of work completed. All force account. Convict labor in Iredell County.

Ohio, Muskingum and Licking Counties. Portland cement concrete, 24 miles of the "Old National Road." U. S. allotment \$120,000. 14½ miles complete. Work stopped by weather conditions. All contract work. C. H. Moorefield, S.H.E., in charge (now in Washington Office); assisted by W. E. Rosengarten, H.E., and J. T. Pauls, J.H.E., (both now in Washington Office).

South Carolina, Aiken County. Sand-clay and top soil, 27.6 miles. U. S. allotment \$10,000. Contract work. W.J.R. Weir, H.E., Aiken, S. C., in charge, assisted by E. S. Alderman, J.H.E.

Tennessee, Loudon County. Macadam and chert, 6.4 miles. Contract work. 65% work done. U. S. allotment \$10,800. C. T. Harrison, S.R.C., in charge (on furlough Baton Rouge, La.) Assisted by M. E. Worrell, H.E., Loudon, Tenn., in charge during Mr. Harrison's absence.

Tennessee, Montgomery County. Macadam, 7.65 miles. U. S. allotment \$10,000. Contract work. J. A. Whittaker, S.H.E., in charge, Clarksville, Tenn.

Texas; Bexar, Guadalupe, Comal, Hays, and Travis Counties. Gravel, 71.14 miles. U. S. allotment \$76,625. Contract work, bids opened January 22. W. A. Crossland, S.H.E., San Antonio, Texas, in charge. Assisted by J. W. Janssen, H.E., San Marcos, Texas; H. C. Wells, S.R.C., New Braunfels, Texas; L. L. Winans, J.H.E., 203 E. Hilton St., Austin, Texas.

Virginia, Fairfax County. Gravel, 12.33 miles. U. S. allotment \$16,900. 60% work completed. Contract work. J. D. Fauntleroy, S.H.E., 917 Prince St., Alexandria, Va., in charge. Assisted by A. S. Hathaway, J.H.E., 3607 Livingston St., N.W., Washington, D. C.

Virginia; Spotsylvania, Caroline, and Hanover Counties. Top-soil road, 33.8 miles. U. S. allotment \$17,925. Spotsylvania county road completed, Caroline county practically so, 95% in Hanover. W. H. Lynch, S.H.E., Partlows, Va., in charge. Contract work.

Bridge Work, O.L.Grover, Bridge Engineer,
in charge.

Preparation of text and tables for a department bulletin on highway culverts and short-span bridges, to succeed our Bulletin 45. Preparation of text and tables to bring up to date our general specifications for steel and concrete bridges. These will be used in bulletin

mentioned. Work will probably not be completed until last of February. C. W. Childs, S.H.E., assisting Mr. Grover, Washington Office. L. W. Erickson, H.B.E., has just been appointed to assist in bridge engineering work, is in Washington Office.

DIVISION OF ROAD MAINTENANCE.
E. W. James, Chief.

Projects:

Representative State Systems.

Details of road maintenance under state road organizations are being studied in representative states, such as New Hampshire, Maine, Massachusetts, and New York.

Representative County Systems.

County methods are being studied in counties having a more or less well organized road administration, such as Duval County, Florida; Montgomery County, Alabama; etc.

Post Road Maintenance.

Plans are forming to inaugurate maintenance on the post roads in Maine, Ohio, and Texas, with a view to obtaining exact maintenance costs similar to those obtained on the Montgomery County, Maryland, experimental road.

Washington-Atlanta Highway.

Demonstration road maintenance is being conducted on the Washington-Atlanta Highway from Petersburg, Va., southward. A total of 723.7 miles are now under the supervision of this Office. This is about 71.9% of the total distance from Washington to Atlanta on the selected route. The engineers assigned to the work are:

- G. C. Scales, S.H.E., 701 North Boulevard,
Atlanta, Ga.
- W. L. Spoon, S.H.E., Southern Pines, N. C.
- V. E. Towles, H. E., Benson, N. C.
- D. H. Winslow, S.R.C., Hotel Malbourne,
Durham, N. C.

Some excellent photographs of before and after construction, on this road, have been secured.

Cost Data.

Maintenance is being conducted on all the experimental roads built near Washington, as well as the 8 miles of dirt road in Alexandria County, Virginia. The

exact cost of this maintenance is carefully segregated and will be used in a detailed report for purpose of developing the cheapest method of surface treatment, and incidentally for devising a more exact scheme for indicating maintenance cost in relation to traffic than any now used. The report will be completed this month.

DIVISION OF NATIONAL PARK AND FOREST ROADS.
T. W. Allen, Chief.

Projects:

National Forest Roads.

Cooperative road work with the Forest Service has been started in Districts Nos. 2, 3, 4, 5, and 6.

District 2, headquarters, Denver, Colorado. A. E. Palen, H.E., in charge. Field work closed for winter. Mr. Palen, at the District Office, is preparing plans and estimates for 1915 construction work.

District 3, headquarters, Albuquerque, N. M. O. N. Powell, H.E., in charge. Field work closed for winter. Mr. Powell at District Office, preparing plans and estimates for 1915 construction work.

District 4, headquarters, Ogden, Utah. C. H. Kendall, S.H.E., in charge. Construction work in progress on Payette River Road in Idaho, and on Escalante-Winder Road in Powell National Forest, Utah. All other field work closed for winter. Mr. Kendall at District Office, preparing plans and estimates for 1915 construction work.

District 5, headquarters, San Francisco, C. C. Morris, H.E., in charge. Field work closed for winter. Mr. Morris at District Office, at work on plans for 1915 work.

District 6, headquarters, Portland, Oregon. James T. Schuyler, S.H.E., in charge. Field work closed for winter. Mr. Schuyler at District Office, working on plans for 1915 construction work. All these men should be addressed, "care of Forest Service District Office."

National Park Roads.

Work in cooperation with the Interior Department is being carried on at Yosemite, Cal. B. J. Finch, S.H.E., Yosemite, is in charge. Field work is closed for winter. Mr. Finch at Yosemite Office, preparing plans and estimates for several roads, the El Portal-Yosemite-Nevada Falls Road in Yosemite National Park, the Fish Creek and Lake McDonald Roads in Glacier Park, and the Grant Forest-Marble Fork-North Park Line Road in Sequoia Park. His assistants are:

J. W. Ball, C.E.S., and T. C. Peterson, C.E.S., Yosemite, Cal., "care of Mr. Finch."

DIVISION OF PHYSICAL TESTS,
under Mechanical Engineer, E. B. McCormick.

Projects:

Instruction of Students in Highway Engineering.
The civil engineer students are being instructed in methods of conducting the routine tests on road materials, and in the deductions to be drawn from the results of such tests.

Physical Testing of Road Building Materials.
Samples are being tested to determine their value for road building materials, as usual. Reports of these tests will be sent to the persons requesting the tests, who contemplate the use of such materials in road work.

Concrete Investigations.
The second reinforced concrete bridge slab of 16-foot span and 32-foot width is now under construction in the laboratory on the Arlington Farm.

A reinforced concrete beam 5 inches wide, 7 inches deep, and with 10 foot span, is being subjected to a continuous central load of 1,225 pounds. This load has been continuous for 5 weeks. The object of this test is to determine what ability a concrete member may have to restore itself after being subjected to a continuous load.

52 concrete specimens 56 inches long are under test for contraction and expansion; 100 under long-time strength tests. Tests are also under way to determine effect on strength of concrete of freezing during setting, vibration during setting, and presence of acids formed in silage.

Nonbituminous Road Materials Investigations.
No work is being carried on at present.

Standardization of Tests on Nonbituminous Road Materials.
37 samples of various road materials that have been previously tested are being put through to give a check on the results obtained in the laboratory. In cooperation with a committee of the American Society of Testing Materials, tests are being made to devise a method for determining accurately the weight of sand of various volumes. An attempt is being made to standardize methods of washing sands and gravels.

Instrument Making and Repairing.
Special apparatus is being made for investigations being carried on under project above. A torsion dynamometer for use in traction tests is under construction.

Traction Tests.

Field work has been stopped by weather. Data obtained in previous experiments are being tabulated. Both preliminary and final tests have been made at Ames, Iowa, and Florence, Alabama, and these records are now being worked up.

DIVISION OF CHEMISTRY, C. S. Reeve, Chemist.

Projects:

Chemical Testing of Road-Construction Materials.

The usual routine analyses of samples of bituminous road materials is being done. Reports of these tests are sent to the persons requesting the tests, who contemplate the use in road work of such materials. Investigations upon the effect of a recently devised salt spray bath upon galvanized metal sheets is being carried on. This will include a study of the bath's effect on various uncoated metals.

Microscopic Examination and Classification of Road-Building Rocks.

The usual routine examination and classification of rock samples is conducted. A study of the effect of the mineral composition and structure of rocks and slags on their physical properties, is being conducted; also a study of the relation of secondary minerals to the cementing value and slaking properties of rocks and gravel.

Investigation of the Properties of Dust Preventives and Road Binders.

The accumulated research tests upon the relative binding value of several classes of bitumen with different types of rock are being studied. The research investigations upon the relation between laboratory and exposure tests in tars have been sufficiently developed to warrant preparation of a short publication.

Standardization of Methods of Testing Bituminous Road Materials.

Investigation of methods for making paraffin scale determination will probably be concluded in time for publication this spring. This work will be continued in conjunction with sub-committee of A.S.T.M. Experiments are being carried on to devise a new method for making melting point determination of bitumens.

Experimental Bituminous Road Construction and Maintenance.

A sand-oil section and an oil surface treatment of coralline rock macadam is being carried on at West Palm Beach, Florida. An inspection and study of sections previously installed there and at Miami, Florida, will also be made. Mr. Reeve is filling this assignment.

Instruction of Students and Highway Engineers.
This work is being carried on during the present month.

Publications, Reports, and Papers.

The annual progress report is being prepared. Bulletin 38, Methods for Examination of Bituminous Road Materials, is being revised. A new bulletin on "Rocks for Road Building" is about ready for publication. The relation of maintenance costs and methods to traffic is being studied in co-operation with the Division of Maintenance, and a technical paper being prepared on the subject.

DIVISION OF ROAD ECONOMICS,
J. E. Pennybacker, Chief.

Projects:

General Statistical and Research Investigations.

Statistics showing road activities during 1914 and appropriations for 1915 are collected through the State collaborators and made immediately available through a card index system. A. P. Anderson, H.E., is in charge. A compilation and index of all state road laws, for the Committee on Road Legislation of the American Highway Association, cooperating with a special committee of the American Bar Association, is now complete, except a part of the indexing. L.E. Boykin, A.R.E., has assisted Mr. Pennybacker in this work. An investigation of the data on unit cost of road building and the operating cost of road-building machinery and equipment has been started, with a view to using it in a handbook later on, if feasible. Our bulletin on Highway Bonds is expected from the Public Printer within the next few days. L. I. Hewes has been in charge of this bulletin.

Road Management, Convict Labor Studies.

Studies showing the efficiency, economy, and health of convicts engaged in road work throughout the United States are now being made. This work has been done in California, Oregon, Washington, Texas, Alabama, and Georgia, and will soon be done in Florida, South Carolina and other states. H. S. Fairbank, H.E., and W. T. Draper, Passed Assistant Surgeon, U. S. Public Health Service, are cooperating in this work, and following an itinerary arranged by this Office.

Economic Study of Highway Systems.

The final report on economic studies of road conditions in the counties of Franklin, New York; Spotsylvania, Dinwiddie, Lee, and Wise, Virginia; Lauderdale, Mississippi; Dallas, Alabama; and Manatee, Florida, is now being prepared for publication. This work was inaugurated by Mr. Pennybacker, who has been assisted in it by M. O. Eldridge, L. I. Hewes, and others.

Economic Studies in Road Management.

A study of the efficiency and economy of state highway management in the United States is under way. Earl H. Barber, H.E., is now investigating the New York system.

Studies are being made in regard to systems of road management throughout the United States. This work involved about 100 counties. R. F. Eastham, H.E., and J. J. Tobin, A.R.E., are assisting in this work.

Traffic Census.

To determine wear and service of highways, and cost of maintenance of various road surfaces under known traffic conditions; also to determine the kind and type of road to be built, traffic censuses are being taken on the Chevy Chase and Rockville, Md., experimental roads; and on the following post roads: Lauderdale County, Ala.; Boone, Story, and Dubuque Counties, Iowa; Montgomery and Bath Counties, Kentucky; Cumberland County, Maine; Montgomery County, Maryland; Leflore and Carroll Counties, Mississippi; Muskingum and Licking Counties, Ohio; Jackson County, Oregon; Loudon and Montgomery Counties, Tennessee; Dinwiddie, Spotsylvania, Hanover, and Fairfax Counties, Virginia; Davie and McDowell Counties, N. C.; Aiken County, S. C. The census is taken every thirteenth day. The second year's census of the Chevy Chase Road has been completed.

Lectures and Demonstration of Road and Bridge Models.

We are cooperating in the extension work of the Agricultural College of Texas, by means of lectures and advice. George H. Marshall, S.R.C., has this assignment, College Station, Texas. Dr. L. I. Hewes, S.H.E., has been assigned to lecture at the road schools of state universities and colleges of Kentucky, Indiana, Ohio, Illinois, Michigan, and Tennessee. There are exhibits of road models in the State Capitols of Arkansas and Indiana. A complete exhibit of road and bridge models has just been completed for the Panama-Pacific Exposition and is now on its way through the Panama Canal. M. O. Eldridge will be in charge of the exhibit.

A model showing roadside treatment is now being built, showing roadside planting, a modern consolidated school, and a suburban residence, modeled after "Monticello," Thomas Jefferson's home.

Two models are being prepared showing the effect of grade and surface on tractive effort.

The photographic and lantern slide files are being thoroughly revised.

A set of self-reading lantern slides has been completed for use at the Panama-Pacific Exposition. Blue prints of road and bridge-building plans and statistical tables are being made. Photographic prints of the test of the full-sized reinforced concrete bridge recently held at the Arlington Farm have been completed, also prints and slides of traction tests made in the District of Columbia, and on post roads in various localities throughout the country.

Library.

Among the books recently added to the Library are: Timbers of Commerce and Their Identification, H. Stone; Engineering Geology, Heinrich Ries and T. L. Watson; Introduction to Study of Igneous Rocks, G. I. Finlay; Graphic Methods for Presenting Facts, W. C. Brinton; Colloids in the Industrial Arts, Dr. Kurt Arndt; Van Nostrand's Chemical Annual, 1913; and Hydrogenation of Oils, Carleton Ellis.

The Library receives monthly bulletins from the state highway departments of California, Illinois, Missouri, New York, and Pennsylvania. It also has a complete file of bulletins, circulars and annual reports from all the state highway departments, and bulletins on road subjects that have been issued by state geological surveys, agricultural experiment stations, and state universities in states that have no highway commission; also reports of highway work in foreign countries. We have numerous bulletins and pamphlets published regularly or intermittently by private firms concerning cement, reinforced concrete, and special surfacing materials for roads.

